PARADYNE®

# TNE1544 and TNE1584

## T1 Network Extenders Installation Instructions

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# Introduction to the TNE1544 and TNE1584

Paradyne's TNE1544 and TNE1584 are loop bonding network extenders for Paradyne's 12000 and 4000 IP Broadband Loop Carriers that provide up to 6 Mbps (TNE1544) or 12 Mbps (TNE1584) of symmetrical bandwidth using T1 lines.

The TNE1544 features four T1 ports, and the TNE1584 eight T1 ports, each capable of up to 1.5 Mbps bandwidth. When used with any Paradyne loop bonding compatible product, one to eight ports may be used to deliver high-speed bandwidth at any given distance. Paradyne's loop bonded technology provides automatic load balancing and fail-over for optimum redundancy and data throughput. In addition the TNE1544 and TNE1584 support repeaters installed on the T1 loop, ensuring maximum distance and flexibility.

The TNE1544 and TNE1584 can be connected to any combination of T1 uplink interface modules, micro interface modules, and network extenders, so long as every connection pairs a provider and a subscriber unit.

## Provider and Subscriber Defaults

The following table highlights the differences between provider and subscriber units.

**Table 1. Unit Defaults by Type**

| Feature | Provider Unit | Subscriber Unit |
|---|---|---|
| Default IP Address | 192.168.254.252 | 192.168.254.251 |
| Out of Band Management | Over Ethernet Ports | Over T1 Ports |
| Inband Management | Over T1 Ports | Over Ethernet Ports |
| Response to Broadcast ARP Request by IP Address | Unit answers. | Unit does not answer; answers only to ARP request specifying its MAC address. |

# Package Contents

Unpack and Inspect the network extender. If there is any visible damage, do not attempt to connect the device. Contact your sales or service provider.

# Release Notes

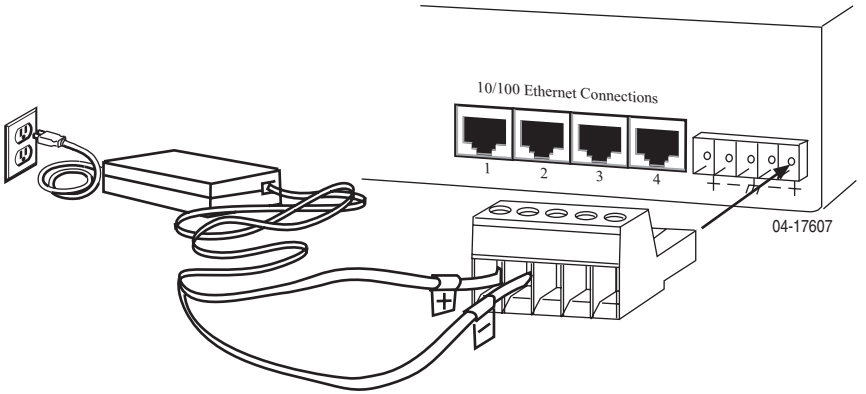
Before installing your network extender, review the release notes for your model. These are available on the Network Extenders Technical Manuals page at the Paradyne website.

# Powering Up the Network Extender

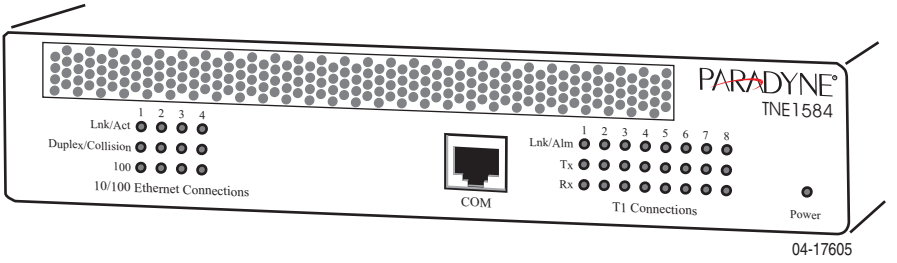
The DC power terminal block on the network extender has five terminals: two positive, two negative, and one ground. Only one positive terminal and one negative terminal pair need be connected for operational purposes. The second positive and negative terminal pair may be connected to a backup DC power supply for redundancy. The ground terminal must be connected regardlessly. DO NOT OPERATE THE NETWORK EXTENDER WITHOUT A GROUND CONNECTION UNLESS IT IS POWERED BY THE SUPPLIED AC POWER ADAPTER.

## ▶ Procedure

1. Loosen all screws at the top of the power terminal strip.
2. Insert your ground wire in the center terminal and tighten the screw.
3. Insert your –48 VDC lead into the negative (–) terminal of a terminal pair. Tighten the screw for that terminal.
4. Insert your 48 VDC return lead into the positive (+) terminal of the same terminal pair as in Step 3. Tighten the screw for that terminal.




5. Repeat Step 3 and Step 4 for the free pair of power terminals if you have a redundant power supply.
6. Verify that the Power LED on the front of the network extender is illuminated.



# Connecting the T1 Lines

The primary feature of the network extender is loop bonding capability, although both the provider and subscriber units are able to function with a single T1 connection.

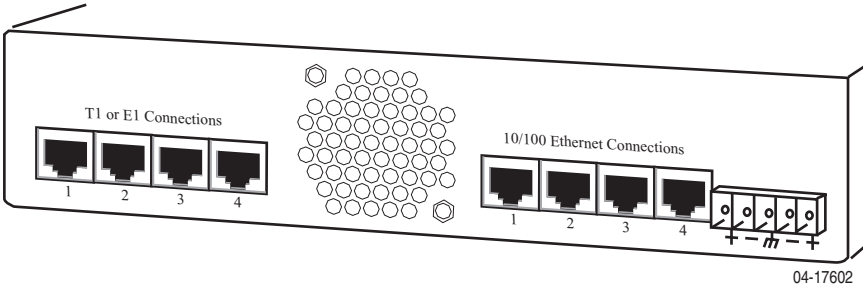
## Loop Bonded Connection

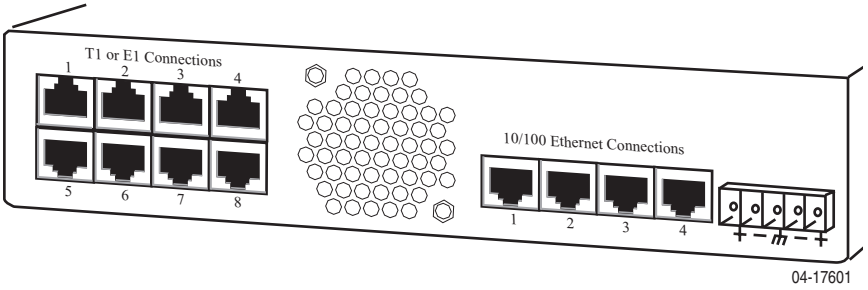
Using multiple T1 lines for one network connection (loop bonding) multiplies the speed and data passing capability of the network extender. Multiple T1 lines also act as a backup should any of the lines become disabled.

A network extender can only establish loop bonded connections with other Paradyne equipment with the loop bonding feature. See *Product to Product T1 Loop Bonding Compatibility* (document number COMP-A2-GK43).

### ▶ Procedure

1. Plug the T1 cables into the T1 Connections RJ48C ports on the back of the network extender. The order of connection is not important.




2. Verify all connections: the T1 Connections Lnk/Alm LEDs on the front of the network extender will pulse green to indicate the connections are established and operational.

### Single T1 Connection

A single line connection can be established between a subscriber unit and any Paradyne T1 provider unit, regardless of loop bonding capability. Likewise, a single line connection can also be established between a provider unit and any of Paradyne's T1 subscriber units, regardless of loop bonding capability.

#### ▶ Procedure

1. Plug the T1 cable into any of the T1 RJ48C ports on the back of the network extender.
2. Verify the connection: the related T1 Connections Lnk/Alm LED on the front of the network extender corresponding to the connected port will pulse green to indicate the connection is established and operational.

## Connecting the Ethernet Lines

The 10/100BaseT Ethernet ports can auto-negotiate speed and duplex mode in accordance with the remote equipment to which it is connected, or Ethernet speed and duplex mode configurations can be configured using NMS. (See *Web Interface* on page 10.) For the best connection results, the remote devices (PCs, hubs, or switches) should be set to auto-negotiate speed and duplex mode.

#### ▶ Procedure

1. Plug the Ethernet cable into one of the 10/100 Ethernet ports on the back of the network extender. A straight-through cable can be used for all applications.
2. Verify the connection: solid green illumination of the corresponding 10/100 Ethernet Connection Lnk/Act (Link/Activity) LED on the front of the network extender indicates a connection has been established. If the Ethernet Lnk/Act LED is illuminated but not the Ethernet 100 LED, then a 10 Mbps connection has been established. If the Ethernet Lnk/Act and 100 LEDs are both illuminated, then a 100 Mbps connection has been established.

# LED Indicators

**Table 2. LEDs (1 of 2)**

| LED | State | Indication | Additional Information |
|---|---|---|---|
| 10/100 Ethernet Connections Lnk/Act | Pulsing Green | Standard operation | Traffic is flowing without any problems. |
| | Solid Green | Ethernet connection is established | If the Ethernet Lnk LED is illuminated but not the Ethernet 100 LED then a 10 Mbps connection has been established. If the Ethernet 100 LED is also illuminated, then a 100 Mbps connection has been established. |
| | Not Illuminated | No Ethernet connection | The Ethernet 100 and Act LEDs will remain unlit by default. |
| 10/100 Ethernet Connections Duplex/ Collision | Solid Amber | Full duplex Ethernet connection. | |
| | Not Illuminated | No link, or functioning at half duplex. | |
| | Pulsing Amber | Half duplex link with packet collisions. | |
| 10/100 Ethernet Connections 100 | Solid Green | 100 Mbps Ethernet connection is established | If the Ethernet 100 LED is illuminated, the Ethernet Lnk/Act LED will be green. |
| | Not Illuminated | No 100 Mbps Ethernet connection | If the Ethernet 100 LED remains unlit but the Ethernet Lnk/Act LED is green, then a connection has been established at 10 Mbps rather than 100 Mbps. |

**Table 2. LEDs (2 of 2)**

| LED | State | Indication | Additional Information |
|---|---|---|---|
| T1 Connections Lnk/Alm (Ports 1–4 or 1–8) | Flashing Green* | T1 connection is established and active | Traffic is flowing. |
| | Solid Green | T1 link | A connection exists but there is indication of a problem with the T1 line. |
| | Solid Amber | Remote Alarm Indication (RAI). The outgoing connection from the unit has been lost; no data is being transmitted. | Yellow alarm. The unit's partner network extender has lost its incoming connection and has LOS. |
| | Pulsing Amber | Alarm Indication Signal (AIS). An indirect connection has been lost; the unit may no longer be receiving data from its partner network extender. | Blue alarm. The unit's partner network extender has lost a connection with an intermediate device and has LOS or RAI. |
| T1 Connections Tx (Ports 1–4 or 1–8) | Flashing Amber | Data is being transmitted. | |
| | Not Illuminated | No data is being transmitted. | |
| T1 Connections Rx (Ports 1–4 or 1–8) | Flashing Amber | Data is being received. | |
| | Not Illuminated | No data is being received. | |
| Power | Solid Green | The unit is operational | If the Power LED is not illuminated, it is unlikely that the network extender is receiving power and therefore none of the LEDs will be illuminated. |

* A pulsing LED blinks steadily at a rate of once per second. A flashing LED blinks at a more rapid, less constant rate.

# Web Interface

The network extender's integral Network Management System (NMS) lets you configure and monitor the network extender using a standard web browser.

To manage a Provider unit using NMS, connect your PC to any Ethernet port of the Provider unit.

By default, the Subscriber unit can be managed by the NMS through its T1 and Ethernet ports, but you must first create a static entry for the unit in your PC's ARP table.

## Establishing an ARP Table Entry for a Subscriber Unit

The subscriber unit will not respond to an ARP request containing the unit's default IP address. In order to manage the subscriber unit using NMS you must create a static ARP table entry on your PC. To build a static ARP table entry:

### ▶ Procedure

1. Get the MAC address from the bottom label of the subscriber unit.
2. Open a command prompt. (Click on Start, then Run. In the **Open:** window type **CMD** and press Enter.) At the command line, type:

   ```
   arp -s 192.168.254.251 xx-xx-xx-xx-xx-xx
   ```

   where the IP address is the default address of the subscriber unit and the MAC address is the number on the bottom label with 1 added to the last byte. For example: if the MAC address on the bottom label is 00-50-ca-01-28-86, use 00-50-ca-01-28-87 in the arp command. If the MAC address on the label is 00-50-ca-01-28-ea, use 00-50-ca-01-28-eb in the arp command.

Once the ARP table entry is configured, you can manage the unit using NMS.

If you change the IP address to anything other than the default, the subscriber unit responds to ARP requests and does not require a static ARP table entry to manage it using NMS.

For security purposes you may want to turn off inband management of the unit to prevent a local PC from managing the unit from the Ethernet ports.

## Web Interface System Requirements

- **Web Browser** – Required for running NMS. Compatible web browsers include, but are not limited to, Microsoft Internet Explorer (v4.0 or higher) and Netscape Navigator (v4.0 or higher). NMS is optimized for use with Internet Explorer.

  Use your browser's default settings when running NMS. JavaScript must be enabled.

- **Screen Resolution** – 1024 x 768 pixels is the minimum resolution required for all NMS views to fit within the dimensions of most monitors and laptops. Lower screen resolutions (such as 800 x 600 pixels) may cause NMS screens to exceed the width or height of the screen. To verify screen resolution on a Windows system:

  — Right click on your desktop

  — Select Properties

  — Click the Settings tab

  — Adjust the Screen Resolution as needed

## Configuring Your Windows PC to Communicate with NMS

To communicate with NMS, your PC's Ethernet interface must be on the same subnet as the network extender. For example, to configure the IP address under Windows XP:

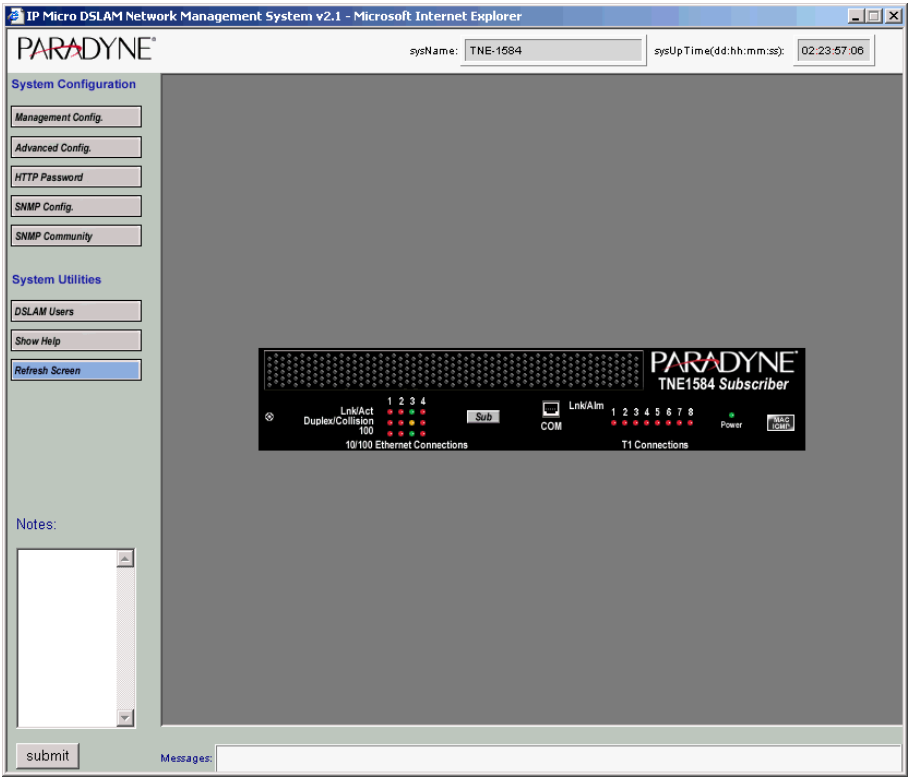
### ▶ Procedure

1. In the Windows task bar, click on the Start button, and then click on Control Panel.
2. Double-click on the Network Connections icon.
3. In the LAN or High-Speed Internet window, right-click on the icon corresponding to your network interface card (NIC) and select Properties. (Often this icon is labeled Local Area Connection.) The Local Area Connection dialog box is displayed with a list of currently installed network items.
4. Ensure that the check box to the left of the item labeled Internet Protocol (TCP/IP) is checked, and click on Properties.
5. Write down the current IP Address and Subnet Mask in the Internet Protocol (TCP/IP) Properties dialog box. When you are done using NMS, you will need to reconfigure your PC with these values.
6. In the Internet Protocol (TCP/IP) Properties dialog box, click in the radio button labeled "Use the following IP address" and type 192.168.254.x (where x is any number between 3 and 250, inclusive) in the IP Address field.
7. Type 255.255.255.0 in the Subnet Mask field.
8. Click on OK twice to confirm your changes, and close the Control Panel.
9. Start your web browser. Type 192.168.254.252 (for a provider unit) or 192.168.254.251 (for a subscriber unit) into the Address field and press Enter. The web server opening screen appears.

**10.** Click on >> Next >>. The login dialog box appears. Log in using:

Username: superuser
Password: Password

The NMS home page appears.



From this screen you can:

| **Click on . . .** | **To configure . . .** |
|---|---|
| Management Config. | IP Address, Subnet Mask, Default Gateway, Inband Management VLAN ID and Priority |
| Advanced Config. | System Name and Location, Management IP Address Filter, TFTP and Telnet access |
| HTTP Password | General and Superuser Passwords |
| SNMP Config. | SNMP Notification IP Addresses and SNMP Traps |
| SNMP Community | SNMP Community Names |
| Ethernet Connections Lnk/Act LEDs | Ethernet Duplex Mode and Speed |
| T1 Connections Lnk/Alm LEDs | T1 Data Rate, Frame Type, Line Code, Tx Buildout, and Clock Source |

# Command Line Interface

The network extender can be managed with a Command Line Interface (CLI) through either a direct PC to COM (Communication) Port connection or from a remote network connection via Telnet.

## CLI System Requirements

- **Straight-Through 8-Pin Modular Ethernet Cable –** Required for establishing a direct connection from the COM port to a DB9 adapter.
- **DB9 Female to 8-Pin Modular Male Adapter –** Required for conversion of your PC's RS232 serial port for use with the Ethernet cable.
- **Terminal Emulation Program –** Required for running the CLI over a direct connection. The program must emulate a VT100 terminal.
- **Telnet Client –** Required for remote management with the CLI. Microsoft Windows Operating Systems (98, 2000, NT, and XP) include a Telnet client which is run using the Windows command prompt (cmd.exe). If you are using an operating system other than Windows, you may need to install a Telnet client.

## Connecting a PC Directly

Initial configuration using the CLI requires a direct physical connection from your PC to the COM port of the network extender you are configuring. (However, the web interface is recommended for subsequent configuration.)

### ▶ Procedure

1. Plug a DB9 to 8-pin modular adapter into the RS232 serial port on your PC. See *DB9 to 8-Pin Modular Adapter Pinouts* on page 17.
2. Connect one end of a straight-through Ethernet cable into the adapter plugged into your PC, and the other end of the cable into the COM port on the face of the network extender.

## Launching the Terminal Emulation Program

Launch the terminal emulation program on your PC and configure the program settings. Actual configurations will depend upon the program being used, though settings should be modeled after the list below; most are standard defaults. Refer to your terminal emulation program's user manual for further information.

| | | | |
|---|---|---|---|
| Baud: | 9600 | Port: | Com 1 |
| Data Bits: | 8 | Stop Bits: | 1 |
| Flow Control: | Software or XON/XOFF | Transmit Delay: | n/a |
| Parity: | none | | |

### Logging Into the CLI

Once your terminal emulation program has been launched, device information is displayed, followed by a request for username and password. You must log in as a superuser in order to make configuration changes.

| | |
|---|---|
| Username: | superuser |
| Password: | Password |

After you have logged in, enter a question mark (?) to list the available commands.

### Using the CLI to Establish Inband Management

CLI Set commands are used to establish inband management. For example:

```
set slot 1 ip_address 137.182.10.251
set slot 1 subnet_mask 255.255.255.0
set slot 1 default_gateway 137.182.10.10
```

The Subscriber unit in this example can now be managed with NMS by attaching a PC to one of the network extender's Ethernet ports and opening the address 137.182.10.251 in a web browser.

## Resetting the Network Extender to Factory Defaults

The network extender supports a reset process that may be used to delete the current configuration and return it to the factory defaults, including the default password.

### ▶ Procedure

To return the network extender to its factory default configuration:

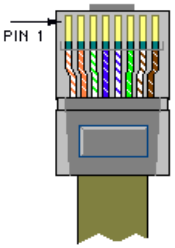
1. The reset button is located behind a small hole on the left side of the faceplate of the network extender. Use a straightened paper clip to gently push the button.
2. Wait a few seconds until the Port LEDs flash green starting at Port 1 and ending at Port 5. Gently push the reset button again during the time that the LEDs are flashing between Ports 1 and 5. NVRAM is cleared, and all configurations on the unit are set to the factory defaults.

# Connector Pin Assignments

## T1 RJ48C Pin Assignments

**Table 3. T1 RJ48C Pin Assignments**

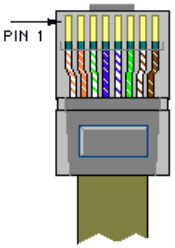
| Pin | Function |
|---|---|
| Pin 1 | Rx Ring |
| Pin 2 | Rx Tip |
| Pin 3 | not used |
| Pin 4 | Tx Ring |
| Pin 5 | Tx Tip |
| Pin 6 | not used |
| Pin 7 | not used |
| Pin 8 | not used |




## Ethernet Pin Assignments

**Table 4. Ethernet Pin Assignments**

| Pin | Function |
|---|---|
| Pin 1 | Rx+ |
| Pin 2 | Rx– |
| Pin 3 | Tx+ |
| Pin 4 | not used |
| Pin 5 | not used |
| Pin 6 | Tx– |
| Pin 7 | not used |
| Pin 8 | not used |



## DB9 to 8-Pin Modular Adapter Pinouts

To connect the COM port to the DB9 serial port of a PC, use an adapter wired as shown:

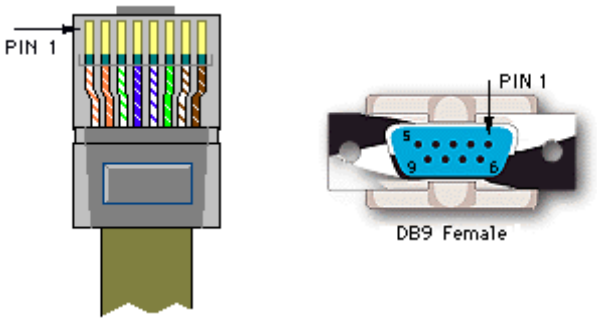



**Table 5. DB9 to 8-Pin Modular Adapter Pinouts**

| Pin | 8-Pin Modular Port | | Direction | PC RS232 Serial Port | | Pin |
|---|---|---|---|---|---|---|
| 1 | Transmit Data | TxD | → | RxD | Receive Data | 2 |
| 2 | Data Set Ready | DSR | ← | RTS | Request to Send | 7 |
| 4 | Receive Data | RxD | ← | TxD | Transmit Data | 3 |
| 5 | Ground | GND | ↔ | GND | Ground | 5 |
| 6 | Data Terminal Ready | DTR | → | CTS | Clear to Send | 8 |

Pins not shown are unused.

# Specifications

Specifications are subject to change without notice.

**Table 6. Specifications**

| Specification | Criteria |
|---|---|
| Bandwidth/Distance | Up to 1.5 Mbps per T1 port<br>TNE1544: Up to 6 Mbps using loop bonded T1 circuits<br>TNE1584: Up to 12 Mbps using loop bonded T1 circuits |
| Dimensions | 1.25" (3.2 cm) High x 8.5" (21.6 cm) Wide x 4.75" (12.1 cm) Deep |
| Interfaces | TNE1544: 4 T1 RJ48C 8-position jacks (Unchannelized T1)<br>TNE1584: 8 T1 RJ48C 8-position jacks (Unchannelized T1)<br>4 10/100BaseT 8-position jacks |
| Operating Environment | Temperature: 32°F to 122°F (0°C to 50°C)<br>Non-operating temperature: –40°F to 158°F (–40°C to 70°C)<br>Humidity: 5% to 95%, non-condensing<br>Altitude: –200 ft to 16,500 ft (–60 m to 5,000 m) |
| Power | TNE1544: –48 VDC, 0.2 A, 11 W<br>TNE1584: –48 VDC, 0.3 A, 15 W |
| Protocols Supported | Transparent 802.1D Bridging<br>T1 Frame Type: ESF, SF<br>T1 Line Code: B8ZS, AMI |
| Regulatory Compliance | EMC: FCC Part 15; ICES-003; EN 300 386-2; CE Marking<br>Safety: UL1950, CSA C22.2 No. 950; EN60950; IEC950; CE Marking<br>Telecom: FCC Part 68; Industry Canada CS-03 |
| Standards Supported | IEEE 802.3 Ethernet<br>IEEE 802.1p Priorities<br>IEEE 802.1Q VLAN |
| Weight | 1.0 lbs (0.45 kg) |

# EMI Notices

### United States – EMI Notice:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The authority to operate this equipment is conditioned by the requirements that no modifications will be made to the equipment unless the changes or modifications are expressly approved by Paradyne Corporation.

If the equipment includes a ferrite choke or chokes, they must be installed per the installation instructions.

### Canada – EMI Notice:

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

# ACTA Customer Information

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the Administrative Council for Terminal Attachments (ACTA). On the bottom of the network extender is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

The T1 network connections should be made using a Universal Service Order Code (USOC) type RJ48C jack. The Service Order Code 6.0F should be specified to the telephone company when ordering the T1 line. In addition, the proper Facility Interface Code must be specified to the Telephone Company. The network extender can be configured to support any of the following framing format and line signaling techniques. The network extender's configuration must correspond to the T1 line's parameters.

| Facility Interface Codes | Code Description |
|---|---|
| 04DU9-BN | 1.544 Mbps superframe format (SF) without line power |
| 04DU9-DN | 1.544 Mbps SF and B8ZS without line power |
| 04DU9-1KN | 1.544 Mbps ANSI ESF without line power |
| 04DU9-1SN | 1.544 Mbps ANSI ESF and B8ZS without line power |

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. See installation instructions for details.

If the network extender causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, please contact your local sales representative, service representative, or distributor directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, training, distributor locations, or Paradyne worldwide office locations, use one of the following methods:

- Internet: Visit the Paradyne World Wide Web site at www.paradyne.com. (Be sure to register your warranty at www.paradyne.com/warranty.)
- Telephone: Call our automated system to receive current information by fax or to speak with a company representative.
  - — Within the U.S.A., call 1-800-870-2221
  - — Outside the U.S.A., call 1-727-530-2340

If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

The customer may make no repairs to the equipment.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

# Supplier's Declaration of Conformity

Place of Issue: Paradyne Corporation
8545 126th Avenue North
Largo, FL 33773-1502
USA

Date of Issue: 15 March 2005

Paradyne Corporation, located at the above address, hereby certifies that the following models: TNE1584-X and TNE1544-X (X = P or S) bearing labeling identification number US:AW2DDNANTNE1584 complies with: the Federal Communications Commission's ("FCC") Rules and Regulations 47 CFR Part 68, and the Administrative Council on Terminal Attachments ("ACTA")-adopted technical criteria TIA-968-A, "Telecommunications - Telephone Terminal Equipment -Technical Requirements for Connection of Terminal Equipment To the Telephone Network, October 2002," as amended by ANSI/TIA-968-A-3 2004, "Telecommunications - Telephone Terminal Equipment -Technical Requirements for Connection of Terminal Equipment to the Telephone Network - Addendum 3."

Patrick Murphy
Senior Vice President, Chief Financial Officer

# Notice to Users of the Canadian Telephone Network

NOTICE: This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation IC before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

NOTICE: The Ringer Equivalence Number (REN) for this terminal equipment is labeled on the equipment. The REN assigned to each terminal equipment provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed five.

If your equipment is in need of repair, contact your local sales representative, service representative, or distributor directly.

# ⚠ Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
3. Do not attempt to service this product yourself, as opening or removing covers may expose you to hazardous voltage or to other risks. Refer all servicing to qualified service personnel.
4. General purpose cables are used with this product for connection to the network. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer. Use a UL Listed, CSA certified, minimum No. 26 AWG line cord for connection to the Digital Subscriber Line (DSL) network.
5. When installed, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
6. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are interconnected, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.
7. Input power to this product must be provided by one of the following: (1) a UL Listed/CSA certified power source with a Class 2 or Limited Power Source (LPS) output for use in North America, or (2) a certified Class II power source, with a Safety Extra Low Voltage (SELV) output having a maximum of 240 VA available, for use in the country of installation.
8. In addition, since the equipment is to be used with telecommunications circuits, take the following precautions:
   - — Never install telephone wiring during a lightning storm.
   - — Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
   - — Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
   - — Use caution when installing or modifying telephone lines.
   - — Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
   - — Do not use the telephone to report a gas leak in the vicinity of the leak.

# Product Documentation Online

Complete documentation for Paradyne products is available at **www.paradyne.com**. Select *Support* → *Technical Manuals*.

To order a paper copy of a Paradyne document, or to speak with a sales representative, please call 1-727-530-2000.

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